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EXAMINER	
HOLLIDAY, JAIME MICHELE	

ART UNIT	PAPER NUMBER
2617	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/521,536	AGHVAMI ET AL.
	Examiner	Art Unit
	Jaime M. Holliday	2617

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-48* is/are pending in the application.

4a) Of the above claim(s) *47 and 48* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment

Response to Arguments

1. Applicant's arguments filed May 30, 2006 have been fully considered but they are not persuasive.

Applicant basically argues, "that the Examiner has misread the cited art as well as the instant invention as presently claimed." In particular, Applicant argues that the cited references do not disclose or suggest a method of improving the use of CDMA systems; instead the cited references focus on FDMA/TDMA systems.

Examiner respectfully disagrees, because, as cited in Applicant's response, Asanuma does disclose that the embodiments disclose may be applied to a system using a CDMA scheme (Asanuma; col. 12 lines 16-19). This is the suggestion and support to apply the cited invention in a CDMA system.

Therefore, Examiner maintains that the 35 U.S.C. 103 rejections are proper.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 1-5, 7-8, 21-25, 27-28, 41-44 and 46** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Asanuma (U.S. Patent # 5,920,819)** in view of **Rappaport et al. (U.S. Patent # 5,437,054)**, and in further view of **Wheatley, III et al. (U.S. Patent # 6,381,230 B1)**.

Consider **claims 1 and 46**, Asanuma clearly shows and discloses a overlay cell type mobile communication system for performing radio communications by forming and laying a macro cell of a macro cell system and a plurality of micro cells of a micro cell system on each other and permitting the macro cell system and the micro cell system to commonly use part or all of a plurality of carrier frequencies, reading on the claimed "method of operating a CDMA cellular communications system on substantially a same frequency band comprising at least one macro cell including a macro cell base station and at least one micro cell including a micro cell base station, the at least one micro cell being located at least in part within an area served by the at least one macro cell base station," (fig. 1, col. 1 lines 5-10), the method comprises the steps of:

(2) micro cell base station detects the reception levels of a plurality of up carrier frequencies and down carrier frequencies for macro cell and search for carrier frequencies whose reception levels are lower than a preset first threshold level, reading on the claimed "receiving an electronic indication representative of the quality of service at one or more cellular communications device served by the macro cell base station," (col. 8 lines 16-20);

(3) available channel searching operation is effected by informing the received carrier frequency to the frequency synthesizer **15** of the micro cell base station, causing the reception circuit **14** to receive the radio signal of the carrier frequency, causing the reception level detecting circuit **31** to detect the reception level of the carrier frequency and comparing the detected reception level with the first threshold level in the controller **30**, reading on the claimed "electronically processing the or each electronic indication to obtain a comparison with a predetermined threshold for said quality of service," (col. 8 lines 22-29); and

(4) carrier frequencies which are less subject to interference are selected from the carrier frequencies which are temporarily determined to be available, reading on the claimed "maintaining quality of service," (col. 8 lines 48-50).

However, Asanuma does not specifically disclose that the carrier frequencies are selected based on power.

In the same field of endeavor, Rappaport et al. clearly show and disclose a method for assigning and sharing channels in a cellular communication system. When all the channels assigned to a cell are utilized, a channel can be borrowed

at limited transmitted power. In order to avoid possible increases in co-channel interference caused by channel borrowing, the borrowed channels are utilized with reduced or limited transmitted power. The limited transmitted power on the borrowed channel is chosen so that co-channel interference for the cellular communication system does not appreciably differ from that of a cellular communication system that does not utilize channel borrowing, reading on the claimed "maintaining said quality of service above said predetermined threshold for any cellular communications device(s) served by the at least one macro cell base station that is within a predetermined range of the micro cell base station by limiting the power of signals transmitted from the at least one micro cell base station," (abstract and col. 9 lines 41-49, lines 59-63).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use power as taught by Rappaport et al. in the system of Asanuma, in order to control interference between cells.

However, Asanuma, as modified by Rappaport et al., does not specifically disclose that the micro cell provides service when permitted by a dynamic interference level.

In the same field of endeavor, Wheatley, III et al. clearly show and disclose a method for providing personal base station, reading on the claimed micro cell base station," communications within a "cell" of a cellular base station, reading on the claimed "macro cell base station," (col. 2 lines 38-40). Unacceptable interference from a subscriber station, which is communicating

with the micro base station, is avoided by the micro base station either terminating communication with the subscriber station or executing a handoff of the subscriber station to the macro base station when transmit power of the subscriber station exceeds a predetermined threshold, reading on the claimed "providing at said micro cell base station non-real time data services when permitted by a dynamic interference level from the perspective of said micro cell, which dynamic interference is caused by said macro cell base station," (col. 3 lines 52-59).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was handover a subscriber station dependent of transmit power as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to avoid unacceptable interference.

Consider **claim 2**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention **as applied to claim 1 above**, and in addition, Wheatley, III et al. further show and disclose a method for providing personal base station, reading on the claimed micro cell base station," ćommunications within a "cell" of a cellular base station, reading on the claimed "macro cell base station," (col. 2 lines 38-40). In **Fig. 1**, line **102** represents the power received at a subscriber station from a macro base station as a function of the distance from the macro base station. Line **104** represents the power received at the subscriber station from the personal base station as a function of the distance from the micro base station.

Therefore, as a subscriber communicating with the macro base station moves away from the macro base station and towards the micro base station, the power received from the micro base station will increase. The power received from the micro base station represents interference to the subscriber station communicating with the macro base station, reading on the claimed "cellular communications device(s) within said predetermined range can be determined by electronically processing signals representative of macro cell interference and micro cell interference at each cellular communications device, the predetermined range being that distance at which micro cell interference is negligible in comparison with macro cell interference," (col. 5 lines 47-57, 65-67).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use power that represents interference as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to determine movement or location of a subscriber.

Consider **claim 3**, and **as applied to claim 1 above**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that the interference of the micro cell is 10dB less than the interference of the macro cell. However, it is known in the art that since the micro cell is smaller and transmits less power than the macro cell, its interference will inherently be less than that of the macro cell.

Consider **claim 4**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention

as applied to claim 1 above, and in addition, Wheatley, III et al. further show and disclose a method for providing personal base station, reading on the claimed micro cell base station," communications within a "cell" of a cellular base station, reading on the claimed "macro cell base station," (col. 2 lines 38-40). In **Fig. 1**, line **102** represents the power received at a subscriber station from a macro base station as a function of the distance from the macro base station. Line **104** represents the power received at the subscriber station from the personal base station as a function of the distance from the micro base station. Therefore, as a subscriber communicating with the macro base station moves away from the macro base station and towards the micro base station, the power received from the micro base station will increase. The power received from the micro base station represents interference to the subscriber station communicating with the macro base station, reading on the claimed "generating an electronic signal representative of said predetermined range, receiving respective electronic signals representative of the distance between said micro cell base station and the or each cellular communications device served by the macro cell, and processing said electronic signals so as to determine those cellular communications devices served by the macro cell that are within said predetermined range" (col. 5 lines 47-57, 65-67).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use power as a function of distance as

taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to determine movement or location of a subscriber.

Consider **claim 5**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., disclose the claimed invention **as applied to claim 4 above**, and in addition Wheatley, III et al. further disclose that as a subscriber communicating with the macro base station moves away from the macro base station and towards the micro base station, the power received from the micro base station will increase. Therefore, the location of the subscriber may be determined using power received, reading on the claimed "electronic signals representative of the distance between said micro cell base station and the or each cellular communications device are obtained by the steps of determining respective estimated geographic position of the or each cellular communications device and processing said estimated geographic position to determine a distance between said micro cell base station and the or each cellular communication device," (col. 5 lines 54-57).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use power as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to determine movement or location of a subscriber.

Consider **claim 7**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention **as applied to claim 1 above**, and in addition, Wheatley, III et al. further show

and disclose a method for providing personal base station, reading on the claimed micro cell base station," communications within a "cell" of a cellular base station, reading on the claimed "macro cell base station," (col. 2 lines 38-40). A power level measurer in the micro base station measures a power level of the delayed received first forward link data signal and a gain adjuster adjusts the power level of the delayed received first forward link data signal in response to the power level measurement in order to scale the first forward link data signal with respect to the second forward link data signal. This scaling is performed in order to ensure sufficient energy of the retransmitted macro base station forward link data at a first subscriber station, reading on the claimed "electronically determining a tolerable micro cell base station power level for the or each cellular communications device served by the macro cell base station and instructing said micro cell base station to transmit all signals at a power substantially no higher than said tolerable level," (col. 3 lines 37-49).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine power as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to control interference.

Consider **claim 8**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., disclose the claimed invention **as applied to claim 7 above**, and in addition Wheatley, III et al. further disclose that the base station informs a second subscriber station of the maximum power that the

second subscriber station using the micro base station is allowed to transmit. The second subscriber station is not allowed to exceed this power while communicating with the micro base station, reading on the claimed "electronically determining a tolerable micro cell base station power level for all cellular communications devices served by the macro cell base station within said predetermined range, and electronically instructing said micro cell base station to transmit signals at a power substantially no higher than the lowest tolerable micro cell base station power that has been determined for said cellular communications devices," (col. 4 lines 3-8).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine power as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to control interference.

Consider **claim 21**, Asanuma clearly shows and discloses a overlay cell type mobile communication system for performing radio communications by forming and laying a macro cell with base stations **BSa1** and **BSa2** of a macro cell system and a plurality of micro cells with base stations **BSb1**, **BSb2** and **BSb3** of a micro cell system on each other and permitting the macro cell system and the micro cell system to commonly use part or all of a plurality of carrier frequencies. The base station includes a controller **30** that has a microcomputer, reading on the claimed "computer operable controller for use with a CDMA cellular communications system comprising at least one macro cell including a

macro cell base station and at least one micro cell including a micro cell base station, at least part of the micro cell being located within an area served by the macro cell base station, said CDMA cellular communications system configured to be operated on substantially the same frequency band(s)," (fig. 1, fig. 10, col. 1 lines 5-10, col. 7 line 26), the controller comprises:

micro cell base station detects the reception levels of a plurality of up carrier frequencies and down carrier frequencies for macro cell and search for carrier frequencies whose reception levels are lower than a preset first threshold level, reading on the claimed "a receiver receiving an electronic indication representative of the quality of service at one or more cellular communications devices served by the macro cell base station," (fig. 2 and col. 8 lines 16-20); and

available channel searching operation is effected by informing the received carrier frequency to the frequency synthesizer of the micro cell base station, causing the reception circuit to receive the radio signal of the carrier frequency, causing the reception level detecting circuit to detect the reception level of the carrier frequency and comparing the detected reception level with the first threshold level in the controller, reading on the claimed "processor electronically processing the or each electronic indication to obtain a comparison with a predetermined threshold for said quality of service," (fig. 2 and col. 8 lines 22-29);

whereby carrier frequencies, which are less subject to interference, are selected from the carrier frequencies, which are temporarily determined to be

available, reading on the claimed “maintaining quality of service,” (col. 8 lines 48-50).

However, Asanuma does not specifically disclose that the carrier frequencies are selected based on power.

In the same field of endeavor, Rappaport et al. clearly show and disclose an apparatus for assigning and sharing channels in a cellular communication system. When all the channels assigned to a cell are utilized, a channel can be borrowed at limited transmitted power. In order to avoid possible increases in co-channel interference caused by channel borrowing, the borrowed channels are utilized with reduced or limited transmitted power. The limited transmitted power on the borrowed channel is chosen so that co-channel interference for the cellular communication system does not appreciably differ from that of a cellular communication system that does not utilize channel borrowing, reading on the claimed “computer programmed to maintain said quality of service above said predetermined threshold for any cellular communication device(s) served by the macro cell base station that is within a predetermined range of the micro cell base station by limiting the power of signals comprising non-real time data services transmitted from the micro cell base station,” (abstract and col. 9 lines 41-49, lines 59-63).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use power as taught by Rappaport et al. in the system of Asanuma, in order to control interference between cells.

However, Asanuma, as modified by Rappaport et al., does not specifically disclose that the micro cell provides service when permitted by a dynamic interference level.

In the same field of endeavor, Wheatley, III et al. clearly show and disclose a method for providing personal base station, reading on the claimed micro cell base station," communications within a "cell" of a cellular base station, reading on the claimed "macro cell base station," (col. 2 lines 38-40). Unacceptable interference from a subscriber station, which is communicating with the micro base station, is avoided by the micro base station either terminating communication with the subscriber station or executing a handoff of the subscriber station to the macro base station when transmit power of the subscriber station exceeds a predetermined threshold, reading on the claimed "providing at said micro cell base station non-real time data services when permitted by a dynamic interference level from the perspective of said micro cell, which dynamic interference is caused by said macro cell base station," (col. 3 lines 52-59).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was handover a subscriber station dependent of transmit power as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to avoid unacceptable interference.

Consider **claim 22**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention

as applied to claim 21 above, and in addition, Wheatley, III et al. further show and disclose a method for providing personal base station, reading on the claimed micro cell base station," communications within a "cell" of a cellular base station, reading on the claimed "macro cell base station," (col. 2 lines 38-40). In **Fig. 1**, line **102** represents the power received at a subscriber station from a macro base station as a function of the distance from the macro base station. Line **104** represents the power received at the subscriber station from the personal base station as a function of the distance from the micro base station. Therefore, as a subscriber communicating with the macro base station moves away from the macro base station and towards the micro base station, the power received from the micro base station will increase. The power received from the micro base station represents interference to the subscriber station communicating with the macro base station, reading on the claimed "processor for determining those cellular communications device(s) within said predetermined range y electronically processing signals representative of macro cell interference and micro cell interference at said cellular communications device(s), the predetermined range being that distance at which micro cell interference is negligible in comparison with macro cell interference," (col. 5 lines 47-57, 65-67).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use power that represents interference

as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to determine movement or location of a subscriber.

Consider **claim 23**, and **as applied to claim 22 above**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that the interference of the micro cell is 10dB less than the interference of the macro cell. However, it is known in the art that since the micro cell is smaller and transmits less power than the macro cell, its interference will inherently be less than that of the macro cell, reading on the claimed "predetermined range is that distance from the micro cell base station at which micro cell interference is at least approximately l0dB less than macro cell interference."

Consider **claim 24**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention **as applied to claim 21 above**, and in addition, Wheatley, III et al. further show and disclose a method for providing personal base station, reading on the claimed micro cell base station," communications within a "cell" of a cellular base station, reading on the claimed "macro cell base station," (col. 2 lines 38-40). In **Fig. 1**, line **102** represents the power received at a subscriber station from a macro base station as a function of the distance from the macro base station. Line **104** represents the power received at the subscriber station from the personal base station as a function of the distance from the micro base station. Therefore, as a subscriber communicating with the macro base station moves

away from the macro base station and towards the micro base station, the power received from the micro base station will increase. The power received from the micro base station represents interference to the subscriber station communicating with the macro base station, reading on the claimed "generator for generating respective electronic signals representative of the distance between said micro cell base station and the or each cellular communications device served by the macro cell, said processor for processing said electronic signals so as to determine those cellular communications devices served by the macro cell that are within said predetermined range," (col. 5 lines 47-57, 65-67).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use power as a function of distance as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to determine movement or location of a subscriber.

Consider **claim 25**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., disclose the claimed invention **as applied to claim 24 above**, and in addition Wheatley, III et al. further disclose that as a subscriber communicating with the macro base station moves away from the macro base station and towards the micro base station, the power received from the micro base station will increase. Therefore, the location of the subscriber may be determined using power received, reading on the claimed "generator means for generating electronic signals representative of the distance between said micro cell base station and the or each cellular

communication can receive an electronic signal representative of a respective estimated geographic position of the or each cellular communications device and can process said signal to determine a distance between said micro cell base station and the or each cellular communication device," (col. 5 lines 54-57).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use power as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to determine movement or location of a subscriber.

Consider **claim 27**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention **as applied to claim 21 above**, and in addition, Wheatley, III et al. further show and disclose a method for providing personal base station, reading on the claimed micro cell base station," communications within a "cell" of a cellular base station, reading on the claimed "macro cell base station," (col. 2 lines 38-40). A power level measurer in the micro base station measures a power level of the delayed received first forward link data signal and a gain adjuster adjusts the power level of the delayed received first forward link data signal in response to the power level measurement in order to scale the first forward link data signal with respect to the second forward link data signal. This scaling is performed in order to ensure sufficient energy of the retransmitted macro base station forward link data at a first subscriber station, reading on the claimed "comprising-means-said processor for determining a tolerable micro cell base station power level for

the or each cellular communications device served by the macro cell base station and means for instructing said micro cell base station to transmit all signals at a power substantially no higher than said tolerable level," (col. 3 lines 37-49).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine power as taught by Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to control interference.

Consider **claim 28**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., disclose the claimed invention **as applied to claim 27 above**, and in addition Wheatley, III et al. further disclose that the base station informs a second subscriber station of the maximum power that the second subscriber station using the micro base station is allowed to transmit. The second subscriber station is not allowed to exceed this power while communicating with the micro base station, reading on the claimed "processor for determining a tolerable micro cell base station power level for all cellular communications devices served by the macro cell base station within said predetermined range, said micro cell base station to transmit signals at a power substantially no higher than the lowest tolerable micro cell base station power that has been determined for said cellular communications devices," (col. 4 lines 3-8).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine power as taught by

Wheatley, III et al. in the combination of Asanuma and Rappaport et al., in order to control interference.

Consider **claim 41**, the combination of Asanuma and Rappaport et al., as modified by Wheatley et al., clearly shows and discloses a overlay cell type mobile communication system for performing radio communications by forming and laying a macro cell with base stations of a macro cell system and a plurality of micro cells with base stations of a micro cell system on each other and permitting the macro cell system and the micro cell system to commonly use part or all of a plurality of carrier frequencies. The base station includes a controller that has a microcomputer, reading on the claimed "base station controller comprising a computer operable controller as claimed in **claim 21**," (fig. 10 and col. 1 lines 5-10, col. 7 line 26).

Consider **claim 42**, the combination of Asanuma and Rappaport et al., as modified by Wheatley et al., clearly shows and discloses a overlay cell type mobile communication system for performing radio communications by forming and laying a macro cell with base stations of a macro cell system and a plurality of micro cells with base stations of a micro cell system on each other and permitting the macro cell system and the micro cell system to commonly use part or all of a plurality of carrier frequencies. The base station includes a controller that has a microcomputer, reading on the claimed "computer readable medium storing computer executable instructions for carrying out a method according to **claim 1**," (fig. 10 and col. 1 lines 5-10, col. 7 line 26). Figure 10 illustrates that

the base station includes memory, therefore it is inherent that the controller can stores executable instructions.

Consider **claim 43**, the combination of Asanuma and Rappaport et al., as modified by Wheatley et al., clearly shows and discloses a overlay cell type mobile communication system for performing radio communications by forming and laying a macro cell with base stations of a macro cell system and a plurality of micro cells with base stations of a micro cell system on each other and permitting the macro cell system and the micro cell system to commonly use part or all of a plurality of carrier frequencies. The base station includes a controller that has a microcomputer, reading on the claimed "computer program comprising program instructions for causing a computer, such as a base station controller, to carry out the method of **claim 1**," (fig. 10 and col. 1 lines 5-10, col. 7 line 26). It is inherent that the microcomputer in the base station uses a program to execute its functions.

Consider **claim 44**, the combination of Asanuma and Rappaport et al., as modified by Wheatley et al., clearly shows and discloses a overlay cell type mobile communication system for performing radio communications by forming and laying a macro cell with base stations of a macro cell system and a plurality of micro cells with base stations of a micro cell system on each other and permitting the macro cell system and the micro cell system to commonly use part or all of a plurality of carrier frequencies. The base station includes a controller that has a microcomputer, reading on the claimed "computer program comprising

program instructions for causing a computer, such as a macro cell base station controller, to perform the method steps of **claim 1**," (fig. 10 and col. 1 lines 5-10, col. 7 line 26). It is inherent that the microcomputer in the base station uses a program to execute its functions.

5. **Claims 6 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Asanuma (U.S. Patent # 5,920,819)** and **Rappaport et al. (U.S. Patent # 5,437,054)**, in view of **Wheatley, III et al. (U.S. Patent # 6,381,230 B1)**, and in further view of **Innes et al. (U.S. Patent # 6,061,565)**.

Consider **claim 6**, and **as applied to claim 5 above**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al. clearly shows and discloses the claimed invention except that the location of the subscriber is obtained using radio location technology.

In the same field of endeavor, Innes et al. clearly show and disclose that in GSM systems there are macro cells and micro cells, and it is known to hand over a mobile station from a micro cell to a macro cell covering the same area. The position of the mobile station may be calculated at the time of a handover, (col. 5 lines 37-50). Its position can be determined by triangulation at one of two places or one of two areas, reading on the claimed "obtaining said respective estimated geographic position of the or each cellular communications device with a radiolocation method," (col. 3 lines 44-46).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine location using triangulation as taught by Innes et al. in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control communication in a system with macro and micro cells.

Consider **claim 26**, and **as applied to claim 25 above**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al. clearly shows and discloses the claimed invention except that the location of the subscriber is obtained using radio location technology.

In the same field of endeavor, Innes et al. clearly show and disclose that in GSM systems there are macro cells and micro cells, and it is known to hand over a mobile station from a micro cell to a macro cell covering the same area. The position of the mobile station may be calculated at the time of a handover, (col. 5 lines 37-50). Its position can be determined by triangulation at one of two places or one of two areas, reading on the claimed "position estimator means for obtaining said respective estimated geographic position of the or each cellular communications device by a radiolocation method," (col. 3 lines 44-46).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine location using triangulation as taught by Innes et al. in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control communication in a system with macro and micro cells.

6. **Claims 9 and 29** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Asanuma (U.S. Patent # 5,920,819)** and **Rappaport et al. (U.S. Patent # 5,437,054)**, in view of **Wheatley, III et al. (U.S. Patent # 6,381,230 B1)**, and in further view of **Bloch (U.S. Patent # 6,765,898)**.

Consider **claim 9**, and **as applied to claim 7 above**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al. clearly shows and discloses the claimed invention except that the location of the subscriber is obtained using radio location technology.

In the same field of endeavor, Bloch clearly shows and discloses a CDMA mobile communications system with macro cells and micro cells. Interference with the reception from mobile stations located within micro cell **C2** and sending with clearly lower transmitting power than mobile station **MS** may occur with micro cell **C2**, reading on the claimed "tolerable micro cell base station power level is a fraction of the power of signals from the macro cell base station," (fig. 1, abstract, col. 2 lines 33-36).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the power level of mobile stations in the micro cell less than those in the macro cell as taught by Bloch in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control interference.

Consider **claim 29**, and **as applied to claim 27 above**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al. clearly shows and discloses the claimed invention except that the location of the subscriber is obtained using radio location technology.

In the same field of endeavor, Bloch clearly shows and discloses a CDMA mobile communications system with macro cells and micro cells. Interference with the reception from mobile stations located within micro cell **C2** and sending with clearly lower transmitting power than mobile station **MS** may occur with micro cell **C2**, reading on the claimed "processor can, in use, determine said tolerable micro cell base station power as a fraction of the power of signals from the macro cell base station," (fig. 1, abstract, col. 2 lines 33-36).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the power level of mobile stations in the micro cell less than those in the macro cell as taught by Bloch in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control interference.

7. **Claims 11, 31 and 45** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Asanuma (U.S. Patent # 5,920,819)** and **Rappaport et al. (U.S. Patent # 5,437,054)** in view of **Wheatley, III et al. (U.S. Patent # 6,381,230 B1)**, and in further view of **Yamashita (U.S. Patent # 6,256,500 B1)**.

Consider **claim 11**, and **as applied to claim 1**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that the time the mobile station is in the micro cell is not determined.

In the same field of endeavor, Yamashita clearly shows and discloses a mobile radio communication system, comprising a macro cell radio base station for forming a macro cell, a micro cell radio base station for forming a micro cell, at least part of the micro cell overlapping with the macro cell, and a mobile station for communicating with the macro cell radio base station when the mobile station is in the macro cell, for receiving a control channel from the macro cell radio base station or the micro cell radio base station, and for determining the moving speed thereof corresponding to the state of the received control channel when the mobile station is present at a position of which macro cell and the micro cell overlap with each other, reading on the claimed "electronically determining a residence time in said predetermined range for the or each cellular communications device served by the macro cell base station, said residence time being useable to substantially maintain the quality of service of said cellular communications device(s)," (col. 3 lines 6-19).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine the speed of a mobile station as taught by Yamashita in the combination of Asanuma and Rappaport et al., as

modified by Wheatley, III et al., in order to control communication in a system with macro and micro cells.

Consider **claim 31**, and **as applied to claim 21**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that the time the mobile station is in the micro cell is not determined.

In the same field of endeavor, Yamashita clearly shows and discloses a mobile radio communication system, comprising a macro cell radio base station for forming a macro cell, a micro cell radio base station for forming a micro cell, at least part of the micro cell overlapping with the macro cell, and a mobile station for communicating with the macro cell radio base station when the mobile station is in the macro cell, for receiving a control channel from the macro cell radio base station or the micro cell radio base station, and for determining the moving speed thereof corresponding to the state of the received control channel when the mobile station is present at a position of which macro cell and the micro cell overlap with each other, reading on the claimed "processor for determining a residence time in said predetermined range for the or each cellular communications device served by the macro cell base station, said residence time being useable to substantially maintain the quality of service of said cellular communications device(s)," (col. 3 lines 6-19).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine the speed of a mobile station

as taught by Yamashita in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control communication in a system with macro and micro cells.

Consider **claim 45**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al. and Yamashita, clearly shows and discloses a overlay cell type mobile communication system for performing radio communications by forming and laying a macro cell with base stations of a macro cell system and a plurality of micro cells with base stations of a micro cell system on each other and permitting the macro cell system and the micro cell system to commonly use part or all of a plurality of carrier frequencies. The base station includes a controller that has a microcomputer, reading on the claimed "computer program comprising program instructions for causing a computer, such as a micro cell base station controller, to perform the method steps of **claim 11**," (fig. 10 and col. 1 lines 5-10, col. 7 line 26). It is inherent that the microcomputer in the base station uses a program to execute its functions.

8. **Claims 12-13 and 32-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Asanuma (U.S. Patent # 5,920,819)** and **Rappaport et al. (U.S. Patent # 5,437,054)**, in view of **Wheatley, III et al. (U.S. Patent # 6,381,230 B1)**, and in further view of **Reemtsma (Pub # U.S. 2002/0009998 A1)**.

Consider **claim 12**, and **as applied to claim 1**, the combination of Asanuma and Rappaport et al., as modified by Wheatley et al., clearly shows and

discloses the claimed invention except that the signals from the micro cell base station stops transmitting signals in order to maintain quality of service.

In the same field of endeavor, Reemtsma clearly shows and discloses a mobile radio communications network wherein transmission power for radio transmission between a terminal **4** and a base station **5** can be varied in order to permit attainment of a determinate transmission quality. If a user terminal transmits with a high transmission power or prompts a base station to transmit with a high transmission power, the terminal may cause interference to one or more other terminals. To minimize this interfering signal, radio transmission is interrupted until a measured interfering signal is below a predefinable interference threshold, reading on the claimed "substantially ceasing transmission of signals from said micro cell base station to cellular communications device(s) served thereby in order to substantially maintain the quality of service of cellular communications devices served by the macro cell base station that are within said predetermined range," (paragraph 48).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to interrupt an interfering signal as taught by Reemtsma in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control communication interference in a system.

Consider **claim 13**, and **as applied to claim 1**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows

and discloses the claimed invention except the service of a mobile station is handed over to the micro cell base station.

In the same field of endeavor, Reemtsma clearly shows and discloses a method for radio transmission in a cellular mobile radio communications network. The mobile radio communications network has means for the selection of a radio cell for the purpose of setting up a radio transmission connection or for the purpose of passing on a radio transmission connection from another radio cell (handover), reading on the claimed "electronically instructing said micro cell base station to take over service of the or each cellular communications device within said predetermined range, enabling resumption or continuation of transmission and reception of signals to and from cellular communications devices served by the micro cell base station and/or macro cell base station," (abstract and paragraph 19).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to handover a signal as taught by Reemtsma in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control communication system.

Consider **claim 32**, and **as applied to claim 21**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that the signals from the micro cell base station stops transmitting signals in order to maintain quality of service.

In the same field of endeavor, Reemtsma clearly shows and discloses a mobile radio communications network wherein transmission power for radio transmission between a terminal and a base station can be varied in order to permit attainment of a determinate transmission quality. If a user terminal transmits with a high transmission power or prompts a base station to transmit with a high transmission power, the terminal may cause interference to one or more other terminals. To minimize this interfering signal, radio transmission is interrupted until a measured interfering signal is below a predefinable interference threshold, reading on the claimed "processor for ceasing transmission of signals from said micro cell base station to cellular communications device(s) served thereby to substantially maintain the quality of service of cellular communications devices served by the macro cell base station and/or micro cell base station," (paragraph 48).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to interrupt an interfering signal as taught by Reemtsma in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control communication interference in a system.

Consider **claim 33**, and **as applied to claim 32**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al. and Reemtsma, clearly shows and discloses the claimed invention, and in addition, Reemtsma further discloses that the mobile radio communications network has means for the selection of a radio cell for the purpose of setting up a radio

transmission connection or for the purpose of passing on a radio transmission connection from another radio cell (handover), reading on the claimed "electronically instructing said micro cell base station to take over service of the or each cellular communications device within said predetermined range, enabling resumption or continuation of transmission and reception of signals to and from cellular communications devices served by the micro cell base station and/or macro cell base station," (paragraph 19).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to handover a signal as taught by Reemtsma in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control communication system.

9. **Claims 14 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Asanuma (U.S. Patent # 5,920,819)** and **Rappaport et al. (U.S. Patent # 5,437,054)**, in view of **Wheatley, III et al. (U.S. Patent # 6,381,230 B1)**, and in further view of **Gorti et al. (Pub # U.S. 2003/0189943 A1)**.

Consider **claim 14**, and **as applied to claim 1**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that service is prioritize based on real-time and non-real-time data.

In the same field of endeavor, Gorti et al. clearly show and disclose a method for transmitting packets in a packet switching network. Packets that are

classified as being urgent to be processed may be referred to as real-time packets. Packets that are classified as not being urgent to be processed may be referred to as non-real-time packets. Real-time packets have a higher priority than non-real-time packets, reading on the claimed "prioritizing service from said micro cell base station to cellular communications devices requiring substantially real-time data above those requiring substantially non-real-time data," (abstract and paragraph 9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to prioritize packets as taught by Gorti et al. in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control a communication system.

Consider **claim 34**, and **as applied to claim 21**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that service is prioritize based on real-time and non-real-time data.

In the same field of endeavor, Gorti et al. clearly show and disclose a system for transmitting packets in a packet switching network. Packets that are classified as being urgent to be processed may be referred to as real-time packets. Packets that are classified as not being urgent to be processed may be referred to as non-real-time packets. Real-time packets have a higher priority than non-real-time packets, reading on the claimed "prioritizing service from said micro cell base station to cellular communications devices requiring substantially

real-time data above those requiring substantially non-real-time data," (abstract and paragraph 9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to prioritize packets as taught by Gorti et al. in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control a communication system.

10. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Asanuma (U.S. Patent # 5,920,819)** and **Rappaport et al. (U.S. Patent # 5,437,054)**, in view of **Wheatley, III et al. (U.S. Patent # 6,381,230 B1)**, in further view of **Kim et al. (Pub # U.S. 2003/0068983 A1)**.

Consider **claim 15**, and **as applied to claim 1**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that macro cell base station has an adaptive antenna.

In the same field of endeavor, Kim et al. clearly show and disclose a mobile communication apparatus with an antenna array, wherein the apparatus includes a base station with an antenna array a mobile station. Information reflecting time-space channel characteristics for each base station antenna is fed back to minimize the effects from fading interference and noise, reading on the claimed "serving cellular communications device(s) from said macro cell base station with at least one adaptive antenna capable of directional transmission

and/or reception, thereby enabling reduction in the necessary transmission power of said micro cell base station and cellular communications devices served thereby to achieve a given signal quality," (abstract and paragraph 20).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have a base station with an antenna array as taught by Kim et al. in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control interference.

11. **Claims 16 and 36** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Asanuma (U.S. Patent # 5,920,819)** and **Rappaport et al. (U.S. Patent # 5,437,054)**, in view of **Wheatley, III et al. (U.S. Patent # 6,381,230 B1)**, and in further view of **Amirijoo et al. (U.S. Patent # 6,728,217 B1)**.

Consider **claim 16**, and **as applied to claim 1**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that data transmission rate is adjusted for stations served by the micro cell base station.

In the same field of endeavor, Amirijoo et al. clearly show and disclose a method for improving quality of data calls within a cellular network by dynamically changing the air interface data rate for transparent and non-transparent services. As the quality of a higher data rate radio link deteriorates below a specified upper quality threshold due to interference, a change of channel coding to a lower data rate is ordered by the network. If the radio link quality measurements after a

specified period of time indicate that the quality level has exceeded a specified lower quality threshold, the data rate is changed back to the higher data rate, reading on the claimed "electronically adjusting the data transmission rate to cellular communications devices served by the micro cell base station," (abstract and col. 2 lines 25-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to change the are interface data rate as taught by Amirijoo et al. in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control interference.

Consider **claim 36**, and **as applied to claim 21**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., clearly shows and discloses the claimed invention except that data transmission rate is adjusted for stations served by the micro cell base station.

In the same field of endeavor, Amirijoo et al. clearly show and disclose a system for improving quality of data calls within a cellular network by dynamically changing the air interface data rate for transparent and non-transparent services. As the quality of a higher data rate radio link deteriorates below a specified upper quality threshold due to interference, a change of channel coding to a lower data rate is ordered by the network. If the radio link quality measurements after a specified period of time indicate that the quality level has exceeded a specified lower quality threshold, the data rate is changed back to the higher data rate, reading on the claimed "processor for adjusting the data transmission rate to

cellular communication devices served by the micro cell base station," (abstract and col. 2 lines 25-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to change the are interface data rate as taught by Amirijoo et al. in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al., in order to control interference.

12. **Claim 35** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Asanuma (U.S. Patent # 5,920,819)**, **Rappaport et al. (U.S. Patent # 5,437,054)**, and **Wheatley, III et al. (U.S. Patent # 6,381,230 B1)**, in view of **Yamashita (U.S. Patent # 6,256,500 B1)**, and in further view of **Kim et al. (Pub # U.S. 2003/0068983 A1)**.

Consider **claim 35**, and **as applied to claim 31 above**, the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al. and Yamashita, clearly shows and discloses the claimed invention except that macro cell base station has an adaptive antenna.

In the same field of endeavor, Kim et al. clearly show and disclose a mobile communication apparatus with an antenna array, wherein the apparatus includes a base station with an antenna array a mobile station. Information reflecting time-space channel characteristics for each base station antenna is fed back to minimize the effects from fading interference and noise, reading on the claimed "serving cellular communications device(s) from said macro cell base

station with at least one adaptive antenna capable of directional transmission and/or reception, thereby enabling reduction in the necessary transmission power of said micro cell base station and cellular communications devices served thereby to achieve a given signal quality," (abstract and paragraph 20).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have a base station with an antenna array as taught by Kim et al. in the combination of Asanuma and Rappaport et al., as modified by Wheatley, III et al. and Yamashita, in order to control interference.

Allowable Subject Matter

13. **Claims 10, 17-20, 30 and 37-40** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jaime M. Holliday whose telephone number is (571) 272-8618. The examiner can normally be reached on Monday through Friday 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jaime Holliday
Patent Examiner

JOSEPH FEILD
SUPERVISORY PATENT EXAMINER